A.D. 1824 . . . . N° 4974.

SPECIFICATION

OF

JOHN M^C^CURDY.

TUBULAR STEAM BOILERS.

LONDON:
PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY:
PUBLISHED AT THE QUEEN'S PRINTING OFFICE, EAST HARDING STREET,
NEAR FLEET STREET.
1854.

Price 3*d.*

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Mc CURDY'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, John Mc Curdy, of New York, in the United States of America, but now of Snow Hill, in the City of London, Esquire, send greeting.

WHEREAS His most Excellent Majesty King George the Fourth, did, by His Letters Patent under the Great Seal of His United Kingdom, bearing date at Westminster, the Fifteenth day of June, 1824, give and grant unto me, the said John Mc Curdy, my ex̃ors, adm̃ors, and assigns, His especial licence, full power, sole privilege and authority, that I, the said John Mc Curdy, my ex̃ors, adm̃ors, and assigns, during the term of years therein mentioned, should and lawfully might make, use, exercise, and vend, within England, Wales, and the Town of Berwick upon Tweed, and also in all His Majesty's Colonies and Plantations abroad, the Invention of "An Improved Method of Generating Steam," being a communication made to me by a certain foreigner residing abroad; in which said Letters Patent there is contained a proviso that if I, the said John Mc Curdy, shall not particularly describe and ascertain the nature of the said Invention, and in what manner the same is to be performed, by an instrument in writing under my hand and seal, and cause the same to be inrolled in His Majesty's High Court of Chancery within six calendar months next and immediately after the date of the said Letters Patent, that then the said Letters Patent, and all liberties and advantages whatsoever thereby granted, shall utterly cease, determine, and become void, as in and by the same, relation being thereunto had, will more fully and at large appear.

NOW KNOW YE, that in compliance with the said proviso, I, the said John M^c Curdy, do hereby declare that the nature of the said Invention, and the manner in which the same is to be performed, are particularly described and ascertained in and by the following description thereof (that is to say):—

The said Invention of "An Improved Method of Generating Steam," to be applied to steam engines for propelling boats, machinery, &c. For this purpose the ordinary boilers in use of every description (either partially or wholly filled with water, and under pressure) are dispensed with; and I declare the improvements to consist, first, in substituting (instead of boilers) one or more vessels, which I have thought proper to term "tubular steam chambers," and which, when heated in a furnace, will convert a given quantity of water (according to the number of chambers) direct from the reservoir that supplies the forcing pump, instantaneously into steam, in sufficient quantity to drive the engine, without the intermediate process of boiling. Secondly, for equalizing the distribution of the water thro' every part of the interior surface of the steam chambers; and, thirdly, for charging or loading the steam chambers with a head or pressure of steam previously to starting the engine. The steam chambers should be constructed of a convenient length, from six to twelve feet, of small diameter, say from five to ten inches, and of sufficient strength (of wrought or cast iron or other material) to resist, when heated, any required pressure of steam. Heads are attached to one end of the steam chambers, into each of which a small tube is inserted, of about one inch in diameter (which are perforated in every part with small holes), and which tubes are termed "injection barrels," extending through the centre of the steam chambers, and connected by means of pipes with the forcing pump. To the other end of the steam chambers, connected by a pipe, is affixed the safety valve, and also the eduction tube for admitting the steam upon the engine. The steam chambers are now set in a furnace, and heated to any required degree of temperature. They are then loaded or charged with steam by injecting water into them by means of a forcing pump (which may be an extra one, and worked by hand); the water passes from the reservoir into the injection barrels, and from thence is forced and distributed in small sprees or streams against the interior surface of the steam chambers, the heat of which instantaneously converts it into steam. As soon as the steam chambers are charged with steam to a sufficient heighth, which is ascertained by the safety valve, it is gradually admitted upon the engine in the usual manner, by means of a cock or valve. As soon as the engine starts, every successive stroke of the forcing pump attached to it will inject into the steam chambers an additional supply of water, and by this means the steam will be constantly kept up. They may be used for high or low pressure engines; power may be encreased to any extent by encreasing the number of steam chambers, also by encreasing the heat of the furnace and the quantity of water injected; each steam chamber, with about an half gill of water injected at every stroke of the forcing pump, is considered about equal to a four or five horse power. The position of the steam chambers in the furnace may be varied; their shape may be straight or with an elbow; the orifice or bore may be uniform or tapering. Each one may have stop cocks to disconnect it from the rest, so as not to stop the engine in case of an accident to any particular one. A cock may also be inserted in the lower side of the steam chambers, to ascertain if the forcing pump injects a greater quantity of water than the chambers are capable of converting into steam. I claim exclusive privilege for the following improvements:—First, for converting water, either warm or cold, (direct from the reservoir that supplies the forcing pump,) instantaneously into steam of any required pressure, and in sufficient quantities to drive the engine without the use of any boiler under pressure. Secondly, the mode or method of distributing the water through every part of the steam chambers, so as to diminish as little as practicable the action of the fire upon the steam chambers. Thirdly, for creating a head of steam by charging the steam chambers previous to starting, and without the use of the engine. The prominent advantages of the steam chambers are, saving in expence of first cost, saving in weight, room, and fuel, exemption from danger, their simplicity, strength, and durability.

In witness whereof, I, the said John M^c Curdy, have hereunto set my hand and seal, this Seventeenth day of June, in the year of our Lord One thousand eight hundred and twenty-four.

JN° M^c CURDY. (L.S.)

AND BE IT REMEMBERED, that on the Seventeenth day of June, in the year of our Lord 1824, the aforesaid John M^c Curdy came before our said Lord the King in His Chancery, and acknowledged the Specification aforesaid, and all and everything therein contained and specified, in form above written. And also the Specification aforesaid was stamped according to the tenor of the Statute made for that purpose.

WINGFIELD.

Inrolled the Eleventh day of December, in the year of our Lord One thousand eight hundred and twenty-four.

LONDON:
Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1854.